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Before the

**FEDERAL COMMUNICATIONS COMMISSION**

OFFICE OF THE SECRETARY

In the Matter of

Amendment of Part 25 of the  
Commission's Rules and Policies  
Pertaining to the Second Processing  
Round of the Non-Voice,  
Non-Geostationary Mobile Satellite  
Service

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IB Docket No. 96-220

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**COMMENTS  
OF  
SATELLIFE, INC.**

SATELLIFE, INC.

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Non-Geostationary Mobile Satellite	)	
Service	)	

**COMMENTS OF  
SATELLIFE, INC.**

Satellife, Inc. ("Satellife"), by its attorneys, hereby submits its Comments in response to the Notice of Proposed Rule Making issued in the above-captioned proceeding.

**INTRODUCTION AND SUMMARY**

Satellife is an international not-for-profit organization which uses an experimental low-earth-orbit satellite, known as Healthsat II, and computer networks to provide low-cost, health-related communication and information services in the developing world. The organization was created by the International Physicians for the Prevention of Nuclear War, recipient of the 1985 Nobel Peace Prize, and is devoted to improving the exchange of information in the fields of public health, medicine, and the environment. Satellife places special emphasis on geographic areas where access to such information is limited by poor communications, economic conditions, or disasters.

Consistent with the Commission's goal of providing spectrum to "as many applicants as possible"<sup>1/</sup> in order to "ensure that the public receives a great array of choices, innovative services, and low prices,"<sup>2/</sup> SatelLife proposes that the Commission establish a requirement that future licensees in the non-voice, non-geostationary mobile satellite service (the "Little LEO" service) reserve time or capacity for use by not-for-profit humanitarian service providers. The establishment of humanitarian service obligations for Little LEO licensees is consistent not only with the public interest, but also with Commission precedent and the Communications Act of 1934, as amended. Moreover, the establishment of a capacity reservation requirement is critical to the ability of not-for-profit humanitarian service providers to obtain access to Little LEO systems. Without a capacity reservation requirement, access to these systems will be prohibitively expensive for many parties who might otherwise be able to take advantage of the unique potential of Little LEO technology.

#### **I. SatelLife's Activities Highlight the Potential Humanitarian Benefits of Little Leo Technology**

As a current provider of humanitarian services using Little LEO technology, SatelLife's activities provide an example of the benefits such entities can provide. SatelLife is an international not-for-profit organization which uses a low-earth orbit satellite and computer networks to provide low-cost, health-related communication and information

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<sup>1/</sup> In the Matter of Amendment of Part 25 of the Commission's Rules to Establish Rules and Policies Pertaining to the Second Processing Round of the Non-Voice, Non-Geostationary Mobile Satellite Service, Notice of Proposed Rule Making, IB Docket No. 96-220, released October 29, 1996, at ¶ 1 ("NPRM").

<sup>2/</sup> Id. ¶ 20.

services in the developing world. Its mission is to improve the exchange of information in the fields of public health, medicine, and the environment. SatelLife places special emphasis on geographic areas where access to such information is limited by poor communications, economic conditions, or disasters.

SatelLife provides its services primarily through a program called HealthNet, a computer network which links individual health care workers, research institutes, medical libraries, health ministries, hospitals, and non-governmental organizations around the world. HealthNet uses Healthsat II, simple ground stations made up of computers linked by modem to radio transmitters, and telephone-based electronic mail ("e-mail") networks to provide services reliably and inexpensively even in areas with little or no telecommunications infrastructure.<sup>3/</sup> To date, HealthNet operates in 21 African countries, one Latin American country, five Asian countries, and Canada. It has the ability to collect data for 50,000 rural and isolated sites worldwide.

An example of the services for which Healthsat II and HealthNet are employed appears in an article published recently in the New York Times which describes an incident in which Kenyan and British doctors collaborated using Healthsat II and the HealthNet network to save the life of a sickle-cell anemia patient.<sup>4/</sup> A copy of the article is attached as

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<sup>3/</sup> Healthnet also provides technical support and user training.

<sup>4/</sup> Glenn Rifkin, *Bringing Advanced Medical Expertise to the World's Poorest Regions*, N.Y. Times, January 22, 1996, at D5. Specifically, the article recounts that doctors in Kenya, unable to reach a good medical library and unable to afford the cost of an over-seas telephone call, sent an e-mail message seeking advice on the use of necessary, but potentially lethal, blood thinning drugs over the HealthNet network. Half a day later, a doctor in London responded over the satellite with advice that saved the patient's life. See id.

Attachment A. Another example is the use of Healthsat II and the HealthNet network by researchers in Zambia and Mozambique to share information on the spread of the HIV virus. Healthsat II also has been used by the World Health Organization's ("WHO's") Tropical Disease Research Program to connect six research centers in Africa and Asia.

An additional program made available by SatelLife is the Program for Monitoring Emerging Diseases ("ProMED"), an international, Internet-based, e-mail network designed to encourage the sharing of information on emerging infectious diseases around the world. ProMED is jointly sponsored by the WHO and the American Federation of Scientists, and serves over 700 subscribers in more than 70 countries and territories. Notably, ProMED played an important role in the identification, tracking, research, and discussion of the 1995 Ebola fever outbreak in Zaire. In addition, a ProMED epidemiologist monitoring e-mail transmissions flowing through Healthsat II in September of this year, made possible the early containment of a Yellow Fever outbreak originating in Brazil.<sup>5/</sup>

SatelLife is engaged in other projects as well, however. For instance, SatelLife, through HealthNet, is working to create and administer a global network for the treatment and study of HIV and sexually transmitted diseases through worldwide e-mail conferencing. SatelLife is also involved in a project called E-Drug, or the Essential Drugs Mailing List.

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<sup>5/</sup> The ProMED epidemiologist monitoring the e-mail transmissions over Healthsat II noticed three anomalous reports of deaths in Ohio and Switzerland due to Yellow Fever, which the victims had contracted while travelling in Manaus, Brazil. The report provided by the epidemiologist to the Centers for Disease Control and, consequently, the United States Department of State prompted the initiation of an inoculation program in Manaus and the issuance of a travel advisory by the State Department, thus arresting further spread of this lethal disease.

This project provides access to a list of persons and organizations with information on drugs that are particularly essential to health care workers around the world.

Finally, SatelLife is experiencing a surge of interest in the use of its experimental communications from a wide variety of organizations. The WHO for example, would like SatelLife's HealthNet system to play a key role in enabling its division for Global Monitoring of Emerging and Communicable Diseases and its Global Vaccine Program to reach remote sites around the world. Also expressing interest in SatelLife's services are the United Nations Development Program, the United Nations Environment Program, the International Development Research Center, the Expanded Program on Immunization, the Rockefeller Foundation's International Clinical Epidemiology Network, the Pan American Health Organization, UNICEF, the Swedish Agency for Research Cooperation with Developing Countries, and the International Program Against Micronutrient Malnutrition.<sup>6/</sup>

**II. A Humanitarian Capacity Reservation Would Promote the Public Interest, and Is Consistent With Both Commission Policy and the Communications Act, as Amended**

**A. A Humanitarian Capacity Reservation Would Promote the Commission's Objectives of Encouraging Multiple Entry and Ensuring that the Public has Access to a Diversity of Low-Cost Information Sources**

A set-aside or capacity reservation for humanitarian services would promote the Commission's objectives of maximizing the number of Little LEO service providers and achieving a diversity of low-cost information sources by making possible the entry of a class

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<sup>6/</sup> Seminars of the United Nations Programme on Space Applications: Selected Papers on Remote Sensing, Satellite Communications and Space Science, U.N. Doc. A/AC.105/621 (1996) at 108. See Attachment B.

of providers that otherwise would find the difficulties of entry prohibitive. Only with significant financial difficulty could a not-for-profit humanitarian service provider afford to construct and launch its own Little LEO system, particularly if system licenses were assigned by auction, as the Commission has proposed.<sup>71</sup> Leasing capacity on an authorized commercial system at commercial rates also is likely to be beyond the financial means of most not-for-profit humanitarian service providers. Even if such leasing arrangements were affordable, most such providers work with limited resources and lease payments would require corresponding reductions in the funds needed for other humanitarian uses. The establishment of a set-aside requirement, therefore, would promote the entry of not-for-profit humanitarian service providers and the provision of additional services, which strict reliance on market forces will not foster.

The promotion of multiple and diverse entry into Little LEO market is not the only public interest benefit a capacity reservation requirement would have, however. Little LEO providers of humanitarian services, such as SatelLife, are highly effective yet inexpensive sources of information in the fields of medicine, public health, and the environment for both public and private sector entities in the United States and other countries. Thus, in addition to benefitting the world community in general, humanitarian service providers can be of great value to the United States public. By facilitating, at minimal cost, the gathering and sharing of information relating to medicine, public health, and the environment, Little LEO providers of humanitarian services can increase the United States' ability to combat illness and environmental problems both at home and abroad. Such providers also can reduce the

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<sup>71</sup> NPRM ¶ 79.



costs, while enhancing the marketability, of American entities operating at home or abroad in medical, health, and environment-related fields. Finally, the information made available by humanitarian service providers can assist American entities in avoiding or minimizing their exposure to health and environmental risks when operating internationally, and the relationships created by not-for-profit humanitarian service providers can create additional business opportunities for commercial providers of Little LEO services.

Little LEO technology is unique in its potential for humanitarian applications. No other technology, satellite or otherwise, can allow access to and from remote geographic areas as inexpensively, or with as much versatility, as Little LEO systems. As the Commission has stated, "LEOs offer an affordable means to meet a growing demand for low-cost mobile communications services."<sup>8/</sup> More specifically, the Commission has stated that the "low power requirements of LEO space stations and their associated portable transceivers,"<sup>9/</sup> which are both "small and inexpensive,"<sup>10/</sup> allow LEO systems to offer a "variety of services and features"<sup>11/</sup> at "substantial cost savings compared with other existing satellite data systems."<sup>12/</sup> These observations are particularly true of Little LEO satellite systems. Moreover, the Commission has recognized that "[c]onstellations of Little LEO

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<sup>8/</sup> In the Matter of Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum to the Fixed-Satellite Service and the Mobile-Satellite Service for Low-Earth Orbit Satellites, Report and Order, 8 FCC Rcd 1812, 1813 (1993), aff'd, 10 FCC Rcd 3404 (1995) ("Allocation of LEO Spectrum").

<sup>9/</sup> Id.

<sup>10/</sup> NPRM ¶ 3.

<sup>11/</sup> Allocation of LEO Spectrum, 8 FCC Rcd at 1813.

<sup>12/</sup> Id.

satellites are capable of providing two-way data services . . . anywhere in the world,"<sup>13/</sup> and that the lower altitudes at which Little LEO systems operate relative to geostationary satellite systems "improve signal quality and reduce the time delay" of their transmissions.<sup>14/</sup> For these reasons, little LEO systems are particularly suited for gathering information from, and providing services to, people in remote and impoverished areas of the world. It is critical, therefore, that the Commission establish a capacity reservation requirement for use by not-for-profit humanitarian service providers.

**B. A Set-Aside Requirement Would Comport with Commission Precedent**

It is well established that the Commission may impose a capacity reservation requirement for public interest purposes where "there are substantially more individuals who want to broadcast than there are frequencies to allocate"<sup>15/</sup> and the Commission's purpose is to achieve "the widest possible dissemination of information from diverse . . . sources."<sup>16/</sup> Indeed, a recent decision by the United States Court of Appeals for the District of Columbia Circuit in Time Warner Entertainment Co. v. F.C.C. upheld the Commission's ability to impose a similar capacity reservation requirement on operators of Direct Broadcast Satellites

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<sup>13/</sup> NPRM ¶ 4.

<sup>14/</sup> Id. ¶ 3.

<sup>15/</sup> Time Warner Entertainment Co. v. F.C.C., 93 F.3d 957, 975 (D.C. Cir. 1996) ("Time Warner"), quoting Red Lion Broadcasting Co. v. F.C.C., 395 U.S. 367, 388 (1969) ("Red Lion").

<sup>16/</sup> Id., quoting FCC v. National Citizen's Comm. for Broadcasting, 436 U.S. 775, 799 (1978) ("NCCB"); see also Turner Broadcasting Sys., Inc. v. F.C.C., \_\_ U.S. \_\_, \_\_, 114 S.Ct. 2445, 2470 (1994), cert. granted, decision pending, No. 95-992 ("Turner").

("DBS").<sup>17/</sup> The capacity reservation requirement at issue arose out of Section 25 of the 1993 Cable Television Consumer Protection and Competition Act of 1992.<sup>18/</sup> That section directed the Commission to

require, as a condition of any provision, initial authorization, or authorization renewal for a provider of direct broadcast satellite service providing video programming, that the provider of such service reserve a portion of its channel capacity, equal to not less than 4 percent nor more than 7 percent, exclusively for noncommercial programming of an educational or informational nature.<sup>19/</sup>

The Court upheld this capacity reservation requirement, in the face of a First Amendment challenge, on the ground that it was "'a reasonable means of promoting the public interest in diversified mass communications.'"<sup>20/</sup>

The Court analyzed the capacity reservation requirement under the same "relaxed standard of scrutiny" as is applied to the traditional broadcast media because the scarcity of channel/orbit allocations for DBS providers was analogous to the scarcity of frequencies for broadcasters.<sup>21/</sup> Applying that standard, the Court reasoned that the capacity reservation requirement was permissible because in addition to being content-neutral<sup>22/</sup> and "hardly

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<sup>17/</sup> Time Warner, 93 F.3d at 977.

<sup>18/</sup> 47 U.S.C. § 335(b)(1).

<sup>19/</sup> Id.

<sup>20/</sup> Time Warner at 977, quoting NCCB, 436 U.S. at 802.

<sup>21/</sup> The Court reasoned that as in the broadcasting context where the Supreme Court has recognized that "there are substantially more individuals who want to broadcast than there are frequencies to allocate" (id. at 975, quoting Red Lion, 395 U.S. at 388), "the demand for [DBS] channel/orbit allocations far exceeds the available supply." Id., quoting In re Applications of Continental Satellite Corp., 4 FCC Rcd 6292, 6293 (1989).

<sup>22/</sup> Id. at 977.

onerous,"<sup>23/</sup> the requirement reflected an acknowledgment that "the economic realities of commercial broadcasting do not permit widespread commercial production and distribution of educational and cultural programs,"<sup>24/</sup> and was accordingly intended to "assure public access to diverse sources of information."<sup>25/</sup> Furthermore, the Court indicated that it was reasonable to achieve this purpose "by requiring DBS providers to reserve a small portion of their channel capacity . . . as a condition of their being allowed to use a scarce public commodity."<sup>26/</sup> The Court also noted with approval the fact that the capacity reservation provision allowed DBS providers to utilize the reserved channel capacity until a noncommercial educational or informational provider began actually using the channels.<sup>27/</sup>

A humanitarian capacity reservation requirement for Little LEO providers would be analogous to the DBS capacity reservation requirement upheld in Time Warner. The scarcity of spectrum for Little LEO use equally justifies the imposition of public interest obligations.<sup>28/</sup> In addition, the requirement would be minimally burdensome, particularly if Little LEO licensees were permitted to utilize the time or capacity reserved for humanitarian providers until such providers actually began utilizing the time or capacity themselves. Establishment of the capacity reservation requirement also would reflect an acknowledgment

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<sup>23/</sup> Id. at 976.

<sup>24/</sup> Id.

<sup>25/</sup> Id.

<sup>26/</sup> Id. at 976-977.

<sup>27/</sup> Id.

<sup>28/</sup> NPRM ¶ 82.

of the fact that the economic realities of the Little LEO industry will prevent the entry of most humanitarian service providers. Finally, by balancing market forces, the capacity reservation requirement would maximize the public's access to a diversity of Little LEO information sources.

The statutory authority for establishing a capacity reservation requirement derives from Sections 4(i), 303(c), 303(f), 303(g), 303(r), 307(a), and 309(a) of the Communications Act of 1934, as amended.<sup>29/</sup> In particular, as the Supreme Court has stated,

it is now well established that [the] general rule-making authority [under 47 U.S.C. § 303(r)] supplies a statutory basis for the Commission to issue regulations codifying its view of the public interest licensing standard, so long as that view is based on consideration of permissible factors and is otherwise reasonable.<sup>30/</sup>

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<sup>29/</sup> 47 U.S.C. §§ 4(i), 303(c), 303(f), 303(g), 303(r), 307(a), 309(a); NCCB, 436 U.S. at 794; see also Allocation of LEO Spectrum, 8 FCC Rcd at 1818 (1993). In particular, Section 303(r) states that

[e]xcept as otherwise provided in this Act, the Commission from time to time, as public convenience, interest, or necessity requires shall . . . [m]ake such rules and regulations and prescribe such restrictions and conditions, not inconsistent with law, as may be necessary to carry out the provisions of this Act, or any international radio or wire communications treaty or convention, or regulations annexed thereto, . . . , to which the United States is or may thereafter become a party.

47 U.S.C. § 303(r).

<sup>30/</sup> NCCB, 436 U.S. at 793-794 (the Court added that "[t]his Court has specifically upheld this rule-making authority in the context of regulations based on the Commission's policy of promoting diversification of ownership").

The Supreme Court has similarly recognized this regulatory authority with respect to the analogous public interest requirements long applied to broadcasters.<sup>31/</sup>

**C. The Set-Aside Could be Accomplished through Time Sharing, the Reservation of Capacity, or the Use of Time Division Multiple Access or Frequency Division Multiple Access Techniques**

As the Commission has suggested with respect to the licensing of additional Little LEO systems in the 148-150.5 MHz, 137-138 MHz, and 400.15-401 MHz bands, the humanitarian set-aside could be accomplished by permitting licensees to utilize time sharing,<sup>32/</sup> the reservation of system capacity, or the use of time division multiple access ("TDMA") or frequency division multiple access ("FDMA") modulation techniques.<sup>33/</sup> If opting for the reservation of time or capacity, the Commission should require each Little LEO system authorized in the Second, and possibly Third Round, application process to

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<sup>31/</sup> See, e.g., NCCB, 436 U.S. at 793-794; Red Lion, 395 U.S. at 379 ("The statutory authority of the FCC to promulgate [the Personal Attacks: Political Editorial Regulations] derives from the mandate to the 'Commission from time to time, as public convenience, interest, or necessity requires' to promulgate 'such rules and regulations and prescribe such restrictions and conditions . . . as may be necessary to carry out the provisions of this chapter . . . .' 47 U.S.C. § 303 and § 303(r). The Commission is specifically directed to consider the demands of the public interest in the course of granting licenses. 47 U.S.C. §§ 307(a), 309(a)."); see also Columbia Broadcasting Sys., Inc. v. Democratic Nat'l Comm., 412 U.S. 113, 118-119 n.7 (1973); United States v. Storer Broadcasting Co., 351 U.S. 192 (1956); National Broadcasting Co. v. United States, 319 U.S. 190 (1943); see also Time Warner, 93 F.3d at 974-977.

<sup>32/</sup> NPRM ¶ 41.

<sup>33/</sup> Id. Alternatively, if the Commission were to conduct a third licensing round, the Commission could designate one of the licenses to be offered as available only to a not-for-profit provider of humanitarian services, or to a consortium of not-for-profit humanitarian service providers. The Commission could then assign the license to the not-for-profit entity or consortium soonest able to launch a satellite and commence provision of services. Because of the financial limitations such entities face, however, the Commission should exempt this license from any auction requirements.

reserve a small, clearly defined percentage of time or capacity on its system for use by at least one not-for-profit humanitarian entity. The Commission also should require licensees to provide the time or capacity reserved for the not-for-profit humanitarian entity either free-of-charge or at cost, as the Commission deems appropriate. SatelLife would prefer that licensees absorb the costs of humanitarian service as part of their public interest obligations, just as DBS and broadcast licensees are required to provide public interest programming at their own expense.

In addition, the Commission could allow licensees to choose the type of arrangement by which access would be provided to the not-for-profit humanitarian entity assigned to a particular licensee. Specifically, the Commission could allow a licensee to supply the humanitarian entity with access to the reserved time or capacity by providing services to the humanitarian entity. Alternatively, the Commission could allow a licensee to supply the humanitarian entity with access by permitting the humanitarian entity to provide services itself, using the licensee's facilities. To ensure ease of compliance and enforcement, however, it is essential that the capacity reservation requirements imposed are clear and measurable.

Eligibility for use of reserved capacity should be limited to not-for-profit providers of humanitarian services. To ensure the efficient use of spectrum, licensees subject to the set-aside requirement should be permitted to utilize time segments or capacity reserved for not-for-profit humanitarian service providers, pending the actual use of the time segments or capacity by such providers.

## **CONCLUSION**

Without a capacity reservation requirement, market realities will eliminate current and future opportunities for Little LEO providers of not-for-profit humanitarian services to pursue their life-saving and environment-preserving work. As a result, the poorest, most isolated inhabitants of the earth would be deprived of resources they desperately need. In addition, private and public sector entities in both the United States and the world community would be deprived of valuable sources information and an inexpensive yet highly effective means of communicating that, if allowed to continue, could expand existing medical and environmental knowledge, and enable professionals to monitor and respond more efficiently to emerging health and environmental problems around the globe. The world community also would be deprived of a promising, low cost means of enhancing people's understanding of other peoples, and thus of improving international relations. Accordingly, to assure that Little LEO humanitarian service providers will be able to conduct their urgently needed operations, and to ensure the American public's access to a diversity of information sources in the Little LEO industry, it is critical that the Commission establish a requirement that




Little LEO licensees must reserve time or capacity for use by not-for-profit humanitarian service providers.

Respectfully submitted,

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## **ATTACHMENT A**

1ST STORY of Level 1 printed in FULL format.

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January 22, 1996, Monday, Late Edition - Final

SECTION: Section D; Page 5; Column 1; Business/Financial Desk

LENGTH: 1145 words

HEADLINE: Bringing Advanced Medical Expertise to the World's Poorest Regions

BYLINE: By GLENN RIFKIN

BODY:

The patient was getting the best care the local doctors could provide. But this case needed outside expertise, and a long-distance phone call was not an option.

There was a low-cost communications alternative, however, thanks to Satellife, a Boston-based nonprofit organization helping bring the information age to parts of Africa and Asia where up-to-date medical information can be scarce.

As Dr. Fred Bukachi, a Kenyan internist, recalls the episode, he and a team of renal surgeons in Nairobi were treating a first-year medical student who had sickle-cell anemia, an incurable blood condition that had been under control. Now, however, the condition had suddenly worsened. As the student's kidneys failed, his doctors knew he had to have blood-cleansing dialysis treatments.

No one on the team had experience putting such a patient on a dialysis machine, which typically requires use of blood-thinning drugs that could be deadly to someone with sickle-cell anemia. There was no good nearby medical library. Even an overseas phone call would cost \$12 a minute -- an unaffordable luxury in an economy where hospitals can afford to spend an average of only \$1 a day on patients.

But turning to the keyboard of his specially outfitted personal computer, Dr. Bukachi typed an urgent call for advice that was sent via radio signals to a nearby satellite earth station. A few hours later the earth station's dish antenna beamed the message to the small Satellife satellite that passes over Africa four times each day.

Several hours later, when the satellite swung into electronic view of Boston, Dr. Bukachi's missive was downloaded to a Satellife ground station, where the organization's staff broadcast it over the global Internet computer web.

Half a day later came an Internet reply to Boston from a physician at St. Mary's Hospital in London who had successfully handled a similar case. The prescribed treatment: small doses of the blood thinner Heparin. A Satellife staff member telephoned Dr. Bukachi with the information. The treatment saved the Kenyan medical student's life.

"In this case, there was no other alternative -- there was no other place to turn for help," said Dr. Bukachi, who serves as Satellife's Africa region director.

The New York Times, January 22, 1996

Since its founding in 1989 by the renowned cardiologist, inventor and promoter of social causes Bernard Lown, Satellife has helped save many lives. Its Healthnet medical network now serves thousands of physicians and health care workers in 15 African nations and parts of Asia.

Healthnet subscribers receive the electronic Healthnet News, a weekly summary of the latest medical research from more than 20 major medical journals. They also get medical information from a growing list of health organizations like the World Health Organization and numerous AIDS research projects.

During last year's outbreak of the dreaded ebola virus in Zaire, Dr. Paul Fountain, an American Baptist missionary and chief physician at Vanga Hospital in Kikwit, the epicenter of the outbreak, used Healthnet to communicate about the disease with other physicians in Africa and elsewhere.

Within African nations, Healthnet gives physicians in even the most remote hospitals access to up-to-date knowledge.

Last year, for example, a doctor in the village of Kafue Gorge in southern Zambia was treating a 12-year-old girl who had severe lesions in her mouth and could barely swallow. Unable to treat the child and cut off by roads washed out in the rainy season, the physician asked for help via Healthnet. Before nightfall he had received instructions from doctors at the University of Zambia, in Lusaka, on how to surgically remove the lesions. After the surgery, the child recovered.

Satellife's founder, Dr. Lown, 74, is as well known for his medical innovations as he is for his political and social causes. He is credited with conceiving the modern cardiac-care unit and founded International Physicians for the Prevention of Nuclear War, an organization that won the Nobel Peace Prize in 1985.

And when he set up Satellife with multimillion-dollar grants from corporations including NEC and AT&T, since supplemented by donors including the actor Hume Cronyn and the media entrepreneur Ted Turner, it was out of recognition that technology and social concerns might be combined.

"Ignorance fosters chaos," said Dr. Lown, who in the case of most of sub-Saharan Africa realized that medical professionals were hampered by an appallingly inadequate communications system. Voice, fax and video-conference transmissions were either unavailable or made unaffordable by government-run telecommunications agencies.

What was required was some sort of "off line" or "store and forward" communications system that did not require connections to the real-time telephone network.

So Dr. Lown and his advisers settled on so-called low-earth-orbit satellite technology. The approach is a stark contrast to the giant geostationary satellites, which are commonly used for telephone and television transmissions in the United States. These complex spacecraft, costing several hundred million dollars to build and up to \$20 million more to launch, are positioned over the equator at an altitude of more than 22,000 miles, where they orbit in unison with the earth's rotation, seeming to hang in a fixed position.

The New York Times, January 22, 1996

A low-earth satellite, which would be the size of a television set and would zip around the globe at an altitude of only 550 miles, could be built and launched for \$1 million. Satellife bought and launched Healthsat 1 in 1991 and three years later sent up a more sophisticated replacement, Healthsat 2, which cost \$2.2 million. Both were paid for with private donations.

Taking 100 minutes for each pole-to-pole orbit of the earth, the satellite makes 14 circumnavigations a day. Every 24 hours, any given spot on earth is within electronic range of the satellite at least four times.

Each time the satellite comes into view, an earth station has approximately 13 minutes to exchange data with Healthsat 2 via radio signal. The network's software allows the spacecraft to poll each earth station in turn, collecting any stored messages and downloading any information collected elsewhere on the globe and addressed to that particular station.

The equipment for each ground station costs less than \$15,000. And as telephone service is gradually improving in some African cities, a Healthnet subscriber can use a modem to transmit messages via local phone line to a centrally located earth station, rather than requiring a satellite antenna at each site.

"We've devised a system that can easily be replicated within a country for free," said John Mullaney, executive director of Satellife. "It is a medical information system that can be run by Africans for Africans and can be sustained internally."

GRAPHIC: Chart: "Around the World"

A small Satellife satellite, 550 miles high, circles over Africa four times a day as the earth rotates beneath it.

LANGUAGE: ENGLISH

LOAD-DATE: January 22, 1996

## **ATTACHMENT B**

Office for Outer Space Affairs  
United Nations Office at Vienna

A/AC.105/621

# SEMINARS

of the  
United Nations Programme on Space Applications

Selected Papers on Remote Sensing,  
Satellite Communications and Space Science  
1996



United Nations  
1996

## HEALTHNET: SOLVING COMMUNICATIONS PROBLEMS FOR HEALTH CARE WORKERS\*

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Cambridge, Massachusetts, United States

### INTRODUCTION

In the developed world, it's an everyday experience to make a voice call, fax transmission, or even to join a videoconference -- often across many time zones, even to the other side of our planet. When SatelLife was founded, these commonplace communication experiences were impossible for health workers in many developing countries -- sometimes because of poor local and international technical facilities, and sometimes because of exorbitant tariffs. Even with today's improved telecommunications networks, communications in remote and rural areas is still difficult or impossible, and always extremely expensive. SatelLife was created to help these people overcome these problems.

### SATELLIFE AND HEALTHNET

#### SatelLife

SatelLife was an initiative of the 1985 Nobel Peace Laureate, the International Physicians for the Prevention of Nuclear War (IPPNW), as a programme to demonstrate that when physicians around the world join together, problems such as the crisis of health care in the developing world can be solved, just as IPPNW demonstrated that physicians from opposite sides of the Cold War could join to call for a ban on nuclear weapons.

SatelLife developed the HealthNet concept of cooperatively shared communications and information services to support public health and medical research in the developing world, and is the administrative centre for HealthNet projects in the developing world. It commenced operations in 1989 and established the first HealthNet in Zambia in 1992. HealthNets now operate in 15 African countries and in four Asian countries.

Satellife is registered as a not-for-profit organization in the Commonwealth of

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\* This paper, which was presented at the United Nations/IAF Workshop on "Space Technology for Health Care and Environmental Monitoring in the Developing World," held at Oslo, Norway, 28 September to 1 October 1995, does not necessarily reflect the views of the United Nations.



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Massachusetts and as a public charity in the United Kingdom. SatelLife is governed by an international Board of Directors, chaired by its founder Dr. Bernard Lown.

### HealthNet

In 1985, Dr. Lown proposed a "Strategic Health Initiative", a low-cost space telecommunications system to support medical education in developing countries. Years of economic decline had resulted in obsolescence and scarcity of medical references and textbooks in African medical schools, and a lack of subscriptions to the medical journals where all the latest medical knowledge is found. Although modern communications might have helped to remedy this information gap, conventional telecommunications in Africa and much of the developing world was both poor quality and extremely expensive, especially for underfunded public health programmes. The HealthNet concept came into being as a means to bring together medical schools, institutions, and medical users of telecommunications in each country, to obtain better quality, more affordable international telecommunications services, using communications and computer technology with costs that are within the reach of developing countries and organizations.

Because the Healthnet concept was intended to provide access to information becoming available in digital form, and because electronic message systems are the most efficient use of scarce, unreliable, and expensive communications, Healthnet was designed as a computer-based message system that gives health care workers around the world access to the global Internet, and provides them with access to appropriate sources of information through the Internet.

### HEALTHNET TODAY

HealthNet now serves health workers in the developing world, especially Africa, in medicine, public health, and the environment, including academic medical centers, research institutes, medical libraries, health ministries, hospitals and clinics, non-governmental organizations (NGOs), grassroots associations, and other organizations concerned with the improvement of health.

HealthNet is made up of member national HealthNet sub-networks. Each is under local control of a Users (or Licensing) Council, which functions as a Board of Directors, and a Steering Committee or smaller planning group, that can look after day-to-day issues much like an Executive Committee. In 1993, these HealthNets began to change from informal university-based research projects to legally registered NGOs, operating on a cost recovery basis as not-for-profit businesses. HealthNets would often continue on the same premises, but independent of the universities.

### INFORMATION SERVICES

The information services offered by SatelLife to health workers in the developing world are based on two facts: an acute shortage of current health information; and the isolation of the